

# Sensory Acceptability of Rabbit Longganisa in The Municipality of Isabel, Leyte

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## ABSTRACT

In the Philippines, rabbits (*Oryctolagus cuniculus*) have been domesticated due to their cute nature and appearance. But unknown to many Filipinos, rabbit meat as a functional food is popular among foreign countries, especially in European countries, as it is a good source of protein with low fat and low cholesterol content. There is hesitance among Filipinos regarding rabbit meat consumption. This study aimed to evaluate the sensory acceptability of rabbit longganisa. The study used quantitative descriptive research and purposive sampling in choosing the respondents. The study was conducted in the municipality of Isabel, Leyte. A total of 130 respondents from different groups were purposely chosen for the data-gathering process. The research instrument used in this study is a modified sensory evaluation score sheet evaluated on a Five-Point Hedonic Scale. It was concluded in the study that rabbit longganisa is accepted by consumers in the locale of the study. Its sensorial properties, such as appearance, aroma, taste, juiciness, texture, tenderness, and general acceptability, have an overall description of being **liked very much**. It is recommended that rabbit longganisa may be considered a functional food for meals. It is a healthier food choice due to its main rabbit meat ingredient compared to pork and chicken. Rabbit longganisa could also open new doors for business opportunities in the country.

**Keywords:** Rabbit longganisa; Sensory acceptability; Five-point hedonic scale; Food product; VSU-Isabel.

## INTRODUCTION

Rabbit (*Oryctolagus cuniculus*) meat has a long history in culinary as an essential element in traditional cuisines all over the globe, especially in the Mediterranean region (Petracci & Cavani, 2013).

It is considered a high source of protein that contains a wide range of micronutrients (Leroy & Petracci, 2021) and a moderate energy source. However, unknown to many Filipinos, rabbit meat is quite famous as a functional food in foreign countries, provided its consumption entails many health benefits.

With the widespread African swine fever and Bird Flu, the Department of Agriculture considers rabbit meat a healthier alternative to pork and chicken (Cudis, 2021). Nevertheless, the introduction of rabbit meat consumption in the country received an uproar from many Filipinos as they were accustomed to domesticating rabbits due to their endearing nature (Sarmiento, 2021).

Rabbit meat is also quite pricey due to its unpopularity and limited supply in the country (Rivas, 2021). Rabbit raisers were encouraged to process rabbit-meat-based food products to raise awareness of rabbit meat edibility. The novel food product, rabbit longganisa, was created to respond to these challenges.

This study focuses on assessing the sensory acceptability of rabbit longganisa in terms of its appearance/color, aroma, taste/flavor, juiciness, texture, tenderness, and general acceptability.

This study is a small step forward in promoting the rabbit industry in the country. Collecting varying perspectives and insights regarding the acceptance of rabbit longganisa and assessing its sensorial properties provides insights of consideration which is deemed beneficial to the rabbit industry in the country.

This study established the sensory acceptability of rabbit longganisa in the food market of Isabel, Leyte.

## METHODS

### **Research Design**

The study utilized a quantitative-descriptive research design that determined the acceptability of rabbit longganisa among the study respondents in terms of appearance/color, aroma, taste/flavor, juiciness, texture, tenderness, and general acceptability. Descriptive research design is a type of research design used to describe a population or a phenomenon without controlling the research variables (McCombes, 2022).

### **Participants and Sampling Technique**

The study participants were the residents of the municipality of Isabel Leyte, with no specific age or gender. The participants came from 10 different groups of respondents: teachers, students, PASAR employees, PHILPHOS employees, market vendors, LGU employees, housewives, health workers, canteen owners and staff, and School staff (Non-teaching personnel). The respondents were chosen purposely through purposive sampling. The researchers conducted the mass food tasting from June 2022 to July 2022.

A purposive sampling technique was utilized in this study. It is a sampling technique that does not use probability calculating methods but instead relies on the researcher's judgment regarding the suitability of the respondents for the study ((Nikolopoulou, 2022). Respondents were chosen randomly from 10 different groups of respondents: teachers, students, PASAR employees, PHILPHOS employees, market vendors, LGU employees, housewives, health workers, canteen owners and staff, and School staff (Non-teaching personnel). Furthermore, purposive sampling was utilized to gather essential data with the researchers' limited resources.

### **Research Instrument**

The study used the modified five-point hedonic scale to gather data for the cooked rabbit longganisa based on the sensory properties score sheet. The research instrument has the following scores and descriptions: Five (5) as Liked Very Much, Four (4) as Liked Moderately, Three (3) as Liked Slightly, Two (2) as Disliked, and One (1) as Disliked Very Much.

### **Data Analysis**

After the data had been gathered, the respondents' responses were encoded in a spreadsheet. The mean and the standard deviation were computed for each sensorial property for every group of respondents.

## RESULTS AND DISCUSSIONS

### **Appearance/Color of Rabbit Longganisa**

The appearance of rabbit longganisa is symmetrical and has a capsule shape-like. The longganisa has a golden brown outer layer color when cooked and has a reddish inner layer color, which makes its appearance identified as that of a Philippine native sausage or longganisa.

Table 1 shows the acceptability of the appearance/color of the Rabbit Longganisa. As shown in table 1, the appearance/color of the food product was liked very much by all the respondents. The rabbit longganisa, just like any other longganisa, looks appetizing and enticing as a viand commonly served during breakfast among Filipinos.

The Philippine native sausage or longganisa is a lump of meat encased in a hog casing, has a slightly reddish color when cooked, and has an enriched garlic flavor which brings out the consumer's appetite (Macalaay, 2021). A variety of longganisa recipes and appearances is showcased by almost every region in the Philippines. For example, according to Micutan (2022), the Vigan longganisa has a distinct impression of small and plump yellowish color.

**Table 1.** Acceptability of the Appearance/Color of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
Canteen and Restaurant Owners and Workers	4.54	0.66	Liked Very Much
PASAR Employees	4.54	0.66	Liked Very Much
PhilPhos Employees	4.54	0.52	Liked Very Much
Students	4.54	0.66	Liked Very Much
Housewives	4.69	0.48	Liked Very Much
Non-teaching School Staff	4.85	0.38	Liked Very Much
Health Workers	4.92	0.28	Liked Very Much
Market Vendors	4.92	0.28	Liked Very Much
Local Government Unit Employees	5.00	0	Liked Very Much
Teachers	5.00	0	Liked Very Much
<b>Average</b>	<b>4.75</b>	<b>0.39</b>	<b>Liked Very Much</b>

**Legend:** *Liked Very Much* – 4.3 - 4.50; *Like Moderately* – 3.5 - 4.2; *Liked Slightly* – 2.7 - 3.4; *Disliked* – 1.9 - 2.6; and *Disliked Very Much* – 1.0 - 1.8

As mentioned by respondents number MV5 and LGUE3 “*Mura ra siya ug longganisa nga usual ug appearance*” (It has the appearance of a usual pork longganisa).

### Aroma of Rabbit Longganisa

Rabbit longganisa has a rich garlicky aroma which entices its consumers due to the lots of garlic added to the recipe. Along with other spices such as black pepper, paprika, annatto oil, and sesame oil, it contributes to the strong yet sweet, enticing aroma of the longganisa.

Table 2 shows the acceptability of Rabbit Longganisa in terms of its smell or aroma. As shown in the table, the aroma of the rabbit longganisa was liked very much by all the respondents. Garlic is the crucial ingredient in making longganisa which heightens its garlicky aroma. Other longganisa varieties in the Philippines feature its

smoky aroma due to smoking meat for preservation purposes (Tee, 2022). It indeed brings out the appetite for food consumption. According to Yin et al. (2017), food aroma can increase one's appetite sensation and food intake.

**Table 2.** Acceptability of the Aroma of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
PhilPhos Employees	4.46	0.66	Liked Very Much
Canteen and Restaurant Owners and Workers	4.62	0.65	Liked Very Much
Housewives	4.69	0.48	Liked Very Much
Non-teaching School Staff	4.77	0.44	Liked Very Much
PASAR Employees	4.85	0.38	Liked Very Much
Students	4.85	0.38	Liked Very Much
Health Workers	4.92	0.28	Liked Very Much
Market Vendors	4.92	0.28	Liked Very Much
Local Government Unit Employees	5.00	0	Liked Very Much
Teachers	5.00	0	Liked Very Much
<b>Average</b>	<b>4.81</b>	<b>0.36</b>	<b>Liked Very Much</b>

**Legend:** *Liked Very Much* – 4.3 - 4.50; *Like Moderately* – 3.5 - 4.2; *Liked Slightly* – 2.7 - 3.4; *Disliked* – 1.9 - 2.6; and *Disliked Very Much* – 1.0 - 1.8

As mentioned by respondents number PE3 and T7, "Sweet garlic ang humot niya." While according to respondents NSS2, H5, and S8, "*Humot man ang smell, ahos jud kaayu ug baho*" (It smells good, it has a dominant garlic aroma).

### Taste/Flavor of Rabbit Longganisa

The rabbit longganisa is a hamonado type of longganisa, which has a considerable amount of brown sugar added into the recipe, which brings up its primary sweet and garlicky flavor. All the respondents liked the sweet taste of the rabbit longganisa very much.

Table 3 shows the acceptability of the Taste/Flavor of the Rabbit Longganisa. As shown in the table, rabbit longganisa's flavor was liked very much by the respondents. Philippine longganisa has two main varieties, the *hamonado*, and the *rekado*. The hamonado has an ingredient of brown sugar, which brings out the sweet flavor in a longganisa, and the rekado is made of garlic, vinegar, and spices, bringing up a richer aroma taste. It has a combination of spicy, salty, garlicky, and tangy flavors (Pangilinan, 2020).

**Table 3.** Acceptability of the Taste/Flavor of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
Canteen and Restaurant Owners and Workers	4.46	1.05	Liked Very Much
Students	4.62	0.51	Liked Very Much
Market Vendors	4.77	0.60	Liked Very Much
PhilPhos Employees	4.85	0.55	Liked Very Much
Housewives	4.92	0.28	Liked Very Much
Non-teaching School Staff	4.92	0.28	Liked Very Much
PASAR Employees	4.92	0.28	Liked Very Much
Health Workers	5.00	0	Liked Very Much
Local Government Unit Employees	5.00	0	Liked Very Much
Teachers	5.00	0	Liked Very Much
<b>Average</b>	<b>4.85</b>	<b>0.36</b>	<b>Liked Very Much</b>

**Legend:** *Liked Very Much* – 4.3 - 4.50; *Like Moderately* – 3.5 - 4.2; *Liked Slightly* – 2.7 - 3.4; *Disliked* – 1.9 - 2.6; and *Disliked Very Much* – 1.0 - 1.8

As mentioned by respondents CROW4, HW7 and PE3, “*Balanse ang lasa niya, lami paresan ug rice makagana sa kaon*” (It has a balanced taste and it entices me to consume rice along with it). While according to respondents H2 and T9 “*Okay ra, mura ug manok ang lasa*” (It tastes like chicken). And according to respondents CROW6 “*Masarap siya at parang Pampanga longganisa*” (It tastes good and resembles that of a Pampanga longganisa).

### Juiciness of Rabbit Longganisa

Rabbit longganisa has much juiciness and is palatable enough to be presented to the masses. Its juiciness is primarily evident in its appearance, which causes the shiny, oily look on the longganisa. The rabbit longganisa's juiciness is due to the annatto oil and sesame oil integrated into the ingredients of the longganisa and is felt with every bite.

Table 4 shows the acceptability of the juiciness of the Rabbit Longganisa. As shown in the table, the juiciness of the rabbit longganisa was liked very much by the respondents. Juiciness is thought to come from two sources: salivary moisture and moisture produced by the meat after the initial bite and throughout chewing. It can increase a dish's palatability and the perception of tenderness (Alvares et al., 2021).

**Table 4.** Acceptability of the Juiciness of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
Canteen and Restaurant Owners and Workers	4.46	0.88	Liked Very Much
PASAR Employees	4.62	0.65	Liked Very Much
Students	4.69	0.63	Liked Very Much
Housewives	4.85	0.38	Liked Very Much
Market Vendors	4.85	0.55	Liked Very Much
PhilPhos Employees	4.85	0.55	Liked Very Much
Health Workers	4.92	0.28	Liked Very Much
Teachers	4.92	0.28	Liked Very Much
Local Government Unit Employees	5.00	0	Liked Very Much
Non-teaching School Staff	5.00	0	Liked Very Much
<b>Average</b>	<b>4.82</b>	<b>0.42</b>	<b>Liked Very Much</b>

**Legend:** *Liked Very Much* – 4.3 - 4.50; *Like Moderately* – 3.5 - 4.2; *Liked Slightly* – 2.7 - 3.4; *Disliked* – 1.9 - 2.6; and *Disliked Very Much* – 1.0 - 1.8

### Texture of Rabbit Longganisa

Rabbit longganisa was processed by available market food processors, which gave the fine texture of the food product. It is not lumpy nor grainy in feels, just the right texture for each feeling of the tongue of the consumer.

**Table 5.** Acceptability of the Texture of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
Canteen and Restaurant Owners and Workers	4.54	0.88	Liked Very Much
Market Vendors	4.54	0.97	Liked Very Much
Students	4.69	0.63	Liked Very Much
Housewives	4.77	0.44	Liked Very Much
Non-teaching School	4.77	0.44	Liked Very Much

# Staff

PASAR Employees	4.85	0.38	Liked Very Much
PhilPhos Employees	4.85	0.38	Liked Very Much
Health Workers	4.92	0.28	Liked Very Much
Teachers	4.92	0.28	Liked Very Much
Local Government Unit Employees	5.00	0	Liked Very Much
<b>Average</b>	<b>4.79</b>	<b>0.47</b>	<b>Liked Very Much</b>

**Legend:** Liked Very Much – 4.3 - 4.50; Like Moderately – 3.5 - 4.2; Liked Slightly – 2.7 - 3.4; Disliked – 1.9 - 2.6; and Disliked Very Much – 1.0 - 1.8

Table 5 shows the acceptability of the texture of the Rabbit Longganisa. As shown in the table, the texture of the rabbit longganisa was liked very much by the respondents.

A finer longganisa texture is achieved by grinding the rabbit meat well to avoid a lumpy and coarse texture (Cabrido, 2020). Longganisa, in general, should have a fine texture that gives a smooth and oddly satisfying sensation on the tongue of the consumer as the enzymes catalyze the food in the saliva.

As mentioned by respondent HW9, "*Mura man ug isda ang iyang texture*" (The longganisa has a similar texture to a fish meat's texture).

## Tenderness of Rabbit Longganisa

With the right amount of heat used in cooking and the proper amount of time observed in frying, the rabbit longganisa achieved the right amount of tenderness. Not too hard nor too soft, just the acceptable tenderness resulting from proper cooking, which retained an adequate amount of moisture and lessened the coagulation of proteins in the rabbit meat.

**Table 6.** Acceptability of the Tenderness of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
PASAR Employees	4.62	0.65	Liked Very Much
Canteen and Restaurant Owners and Workers	4.69	0.63	Liked Very Much
PhilPhos Employees	4.69	0.48	Liked Very Much
Students	4.69	0.63	Liked Very Much
Market Vendors	4.75	0.45	Liked Very Much
Non-teaching School	4.85	0.38	Liked Very Much



# Staff

Health Workers	4.92	0.28	Liked Very Much
Housewives	4.92	0.28	Liked Very Much
Local Government	5.00	0	Liked Very Much
Unit Employees			
Teachers	5.00	0	Liked Very Much
<b>Average</b>	<b>4.81</b>	<b>0.38</b>	<b>Liked Very Much</b>

**Legend:** *Liked Very Much* – 4.3 - 4.50; *Like Moderately* – 3.5 - 4.2; *Liked Slightly* – 2.7 - 3.4; *Disliked* – 1.9 - 2.6; and *Disliked Very Much* – 1.0 - 1.8

Table 6 shows the acceptability of the tenderness of the Rabbit Longganisa. As the table shows, the tenderness of the rabbit longganisa was liked very much by the respondents.

Tenderness refers to the consumer's perception of comfort and the disarray of the meat's structure upon chewing (Lepetit and Culioli, 1994). The consumer of the rabbit longganisa has perceived it as tender enough, not hard nor too soft when they start chewing it in their mouths. The integration of cornstarch in the longganisa has kept its moisture and tenderness even after frying (Manalo, 2021).

## General Acceptability of Rabbit Longganisa

**Table 7.** General Acceptability of Rabbit Longganisa

Respondents	Mean	Standard Deviation	Description
Canteen and Restaurant Owners and Workers	4.54	0.88	Liked Very Much
Students	4.69	0.63	Liked Very Much
Market Vendors	4.77	0.38	Liked Very Much
Health Workers	4.92	0.28	Liked Very Much
Housewives	4.92	0.28	Liked Very Much
Non-teaching School Staff	4.92	0.28	Liked Very Much
PASAR Employees	4.92	0.28	Liked Very Much
PhilPhos Employees	4.92	0.28	Liked Very Much
Local Government	5.00	0	Liked Very Much
Unit Employees			
Teachers	5.00	0	Liked Very Much
<b>Average</b>	<b>4.86</b>	<b>0.33</b>	<b>Liked Very Much</b>

**Legend:** *Liked Very Much* – 4.3 - 4.50; *Like Moderately* – 3.5 - 4.2; *Liked Slightly* – 2.7 - 3.4; *Disliked* – 1.9 - 2.6; and *Disliked Very Much* – 1.0 - 1.8



Table 7 shows the general acceptability of the Rabbit Longganisa. As shown in the table, all of the respondents liked very much the general acceptability of the food product.

Products were evaluated on six palatable characteristics, appearance, aroma, taste, juiciness, texture, and tenderness. These six palatable characteristics have a liked very much acceptance of the rabbit longganisa. Thus, the food product's general acceptability has a liked very much description.

The general acceptability of the rabbit longganisa has shown that the public accepts its overall characteristic. Together with the health benefits of rabbit meat in comparison with other types of meat, the food product is also feasible for selling out in the marketplace.

The market vendors were even willing to sell the food product in their respective market stalls in the Isabel wet marketplace.

## CONCLUSION

Based on the results of the data analysis, the researchers, therefore, concluded the following:

**Appearance.** The appearance/color of rabbit longganisa is similar to the usual longganisa sold in the market. Its shape and color are identical to a pork longganisa which has a capsule-like shape with reddish inner layer color. The appearance of the rabbit longganisa was liked very much by all of the respondents of this study.

**Aroma.** The aroma of rabbit longganisa has a strong garlicky aroma which entices its consumers. It is identical to a *hamonado* type of longganisa wherein lots of garlic is added to emphasize its appetizing solid aroma. The aroma of the rabbit longganisa was liked very much by all of the respondents.

**Taste/Flavor.** The rabbit longganisa has a delicious sweet taste resembling a *hamonado* type of longganisa. The rabbit longganisa also has an identical taste to that of a chicken longganisa, as emphasized by the respondents. Consumers were enticed to consume rice together with the longganisa as it adds to their appetite in eating. The taste of the rabbit longganisa was liked very much by all of the respondents.

**Juiciness.** The rabbit longganisa has a considerable juiciness, primarily evident with its shiny, oily look on the outside. When consumed, the juiciness of the longganisa adds more moisture to the mouth. The juiciness is due to the different oil integrated into the recipe. The juiciness of the longganisa was liked very much by all of the respondents.

**Texture.** The rabbit longganisa has a fine texture and resembles that of fish meat's texture, as mentioned by the respondents of the study. It has a finer texture than other homemade longganisa, which has a coarse and lumpy texture. The texture of the longganisa was liked very much by all of the respondents.

**Tenderness.** The rabbit longganisa has a tender meat structure that can be chewed quickly. This results from proper moisture retention with the proper amount of heat applied during frying. The texture of the longganisa was liked very much by all respondents.

**General acceptability.** People are opening their minds towards rabbit meat consumption as a healthier meat alternative if processed into food products such as rabbit longganisa. The food product is also feasible to be sold in the locale's marketplace.

## RECOMMENDATIONS

In making the rabbit longganisa, it is crucial to consider its appearance, aroma, taste, juiciness, texture, and tenderness. It is recommended that:

**To rabbit breeders.** Rabbit breeders may focus on the mass production of fattening rabbits for meat production purposes. This will stabilize the supply and demand chain of rabbit meat, especially in the locality of Isabel Leyte. It is recommended that rabbit breeders start innovating more ideas on producing more rabbit-meat-based food products, such as longganisa, as rabbit meat benefits human health. Rabbit longganisa can increase the target market and generate more income for rabbit breeders.

**To business owners.** Novel food products such as rabbit longganisa may be ventured out as it opens more doors for business opportunities. The taste plus the health benefits are both accepted and in demand in society. Business owners may outsource connections from rabbit meat suppliers such as rabbit breeders to create a network for the rabbit industry. Wholesale purchase of rabbit meat also lessens the production cost.

**To vendors.** Awareness of the nature of one's food product may lead to a better marketing strategy for upfront store vendors. With the health benefits of rabbit longganisa, vendors may sell rabbit-meat-based food products in their stores for ₱12.50 per longganisa. This can be an additional stream of income for vendors.

**To Isabelanon people.** People of the locale may open their minds to rabbit meat and rabbit-meat-based food product consumption as it is healthier than pork and chicken. It could help in addressing health-related issues as a consequence of pork and chicken meat consumption. Rabbit longganisa may also be added to the daily grocery list of the Isabelanon people for their daily consumption.

**To students.** Students may consider rabbit longganisa as a choice of food for their breakfast, lunch, or snacks. They can also sell rabbit longganisa and generate income. Students may conduct more food product research, mainly about different rabbit-meat-based food products.

**To future researchers.** More studies may be conducted regarding the utilization of rabbit, rabbit meat, and its nutritional implications for human health to expand the currently known information regarding cuniculture. Rabbit by-products may also be ventured as another business opportunity. Furthermore, future researchers may study the shelf life of the rabbit longganisa.

## Declarations

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### Competing Interests Statement

The authors declare no competing financial, professional, or personal interests.

### Consent for publication

The authors declare that they consented to the publication of this research work.

### Authors' Contributions

All authors equally contributed to research and paper drafting.

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